

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)
)
Digital Data Transmission Within)
the Video Portion of Television)
Broadcast Station Transmissions)

MM Docket No. 95-42

DOCKET FILE COPY ORIGINAL

COMMENTS
OF
WAVEPHORE, INC.

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Dated: June 23, 1995

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Summary

For the past several years, Washington policy makers and communications industry executives have been talking about the benefits that will accrue to the public from the widespread availability of high-speed digital communications. This proceeding offers an important opportunity for the Commission to expedite that process by affirming that broadcasters may provide data services using their existing facilities as long as those secondary operations do not interfere with their primary service. Unlike the cable and telephone industries, which will require billions of dollars to upgrade their facilities, over-the-air television broadcasters have the ability to begin immediately providing high-speed digital communications to consumers who will be able to access huge amounts of data using inexpensive decoders and their existing computers.

WavePhore, a U.S. company, is the leading proponent of high-speed data broadcasting in the U.S. and internationally, integrating the software and hardware needed to permit broadcast facilities to be used to quickly transmit large amounts of data to personal and business computers. In recent months, it has signed an agreement with Intel, begun operations in Canada and concluded agreements to develop data broadcasting in Russia. Based on these efforts, the market valuation of the company is approximately \$150 million.

WavePhore's current technology is consistent with present NTSC technology and the Commission's own policies, which permit radio and television broadcasters to make whatever subsidiary use of their channels they desire (without mandatory standards) so long as the use does not cause discernable picture degradation or interference to other broadcast stations. The evidence already in the record establishes that there are data broadcasting technologies, such as that of WavePhore, that can be deployed by television broadcasters without causing visible

degradation or interference to other stations. Continued broadcasts using WavePhore's technology in the Phoenix area over more than two years have not led to a single viewer complaint and WavePhore has demonstrated that its technology, which operates in the active portion of the video signal, cannot cause interference to other stations.

WavePhore urges the Commission not to delay this proceeding to consider establishing standards for data broadcasting. Data broadcasting will be directed to specific subscribers with specialized equipment, most if not all of which will be connected to computers. As such, this is not a technology like ghost-cancelling, that requires uniform standards to be successful. In addition, a standards process would raise the problems of consuming critical time and resources, having a stifling effect on improvements, and potentially limiting the use of several technologies that, in combination, could provide even higher data transmission capacity than any single "standard" technology.

WavePhore has no objection to the proposal in the NPRM that licensees retain the right not to have their facilities used for data broadcasting and be able to delete any data that is inserted into their programming without the broadcaster's consent. As to responsibility for content, if the broadcaster is serving as a "programmer to the home" through its data transmissions, WavePhore also agrees with the Commission that it is appropriate that the broadcaster be responsible for the content of the data. WavePhore believes that such program-related datacasting, however, often will not be the case. In such cases, when broadcasters are only providing a conduit for data transmissions unrelated to their broadcast programming, the Commission should not impose a legal obligation on broadcasters to preview or monitor content.

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To: The Commission

COMMENTS OF WAVEPHORE, INC.

WavePhore, Inc. ("WavePhore"), by its attorneys, hereby submits its comments in the above-referenced proceeding. As the leading proponent of high-speed data broadcasting, WavePhore is pleased that the FCC has begun this rulemaking to encourage the development of data broadcasting in the United States. Data broadcasting is an important part of the national and international development of high-speed data links -- one that will permit broadcasters to begin using their existing facilities to offer a competitive service without affecting their primary broadcast obligations. WavePhore urges the Commission to act expeditiously to affirm a flexible regulatory scheme that allows broadcasters to move forward quickly to implement this important new technology.

Background

WavePhore. WavePhore is a research and development company founded in 1990 to develop high-speed data broadcasting equipment and audio and video technologies. Since 1990, WavePhore has invested tens of millions of dollars in developing and promoting data broadcasting, including the software and applications packaging required for integrated operations. Following a successful initial public stock offering in 1994, WavePhore has a market valuation of approximately \$150 million.

WavePhore has developed, among other things, the TVT1/4 datacasting system which transmits data within a television station's broadcast signal at 384 Kbps. As WavePhore has described previously, the TVT1/4 system inserts data into the video signal of a television station between the aural and visual carriers. The data can then be received by anyone with a decoding unit in the station's service area. WavePhore expects these decoders to be sold at prices similar to those for high-end modems and to be designed to plug into existing computers.^{1/} Because the data is inserted into the video signal before the video signal is relayed to the broadcast transmitter, and the transmitter itself is not altered in any way, the TVT1/4 system presents no risk of interference to other stations. WavePhore has tested its system extensively on broadcast stations in the United States through grants of experimental authority from the FCC, and has played a major role domestically and internationally in educating broadcasters and equipment manufacturers about data broadcasting. Dozens of major broadcasters and equipment manufacturers, including NBC, Chris-Craft, Hearst, Cox, Toshiba, and Phillips have been briefed and seen demonstrations on data broadcasting at WavePhore's facilities.^{2/}

^{1/} WavePhore's conversations with NTSC television set manufacturers indicate that the margins on their products make it unlikely that even high-end units will include built-in decoder capability for at least the foreseeable future. Similarly, at least for the near-term, WavePhore does not expect manufacturers of television set-top receivers to produce data broadcasting decoders.

^{2/} WavePhore has engaged in extensive field testing of its TVT1/4 system in the United States. In Phoenix, the TVT1/4 system was originally tested on Channel 12, but has since been tested five days a week for twenty-three months on Channel 3. The technology was been in use for nineteen months on Channel 45, a Chris-Craft station, and Chris-Craft personnel have participated in that testing process. During the experiments in Phoenix, Warren Powis, a television engineer at Cohen, Dippell and Everist, P.C. who has participated in critical viewing tests of advanced television systems, reviewed the technology on a variety of types of commercial television receivers at several sites in the Phoenix area and determined that "there was no perceptible degradation of visual or aural
(continued...)

Currently, WavePhore's most extensive datacasting operations are in Canada, where its subsidiary, WavePhore Canada, Inc., has a communications and applications development platform called "Information Skyway." WavePhore Canada has a contract with the Canadian Broadcasting Corporation ("CBC") for the nationwide distribution of multimedia data to business and consumer users. Initial applications that are currently operating using CBC facilities include the updating of time-sensitive travel package inventory files for travel agents, an electronic clipping service that provides articles from 15 newspapers on selected topics, and a service that provides newspaper headlines and articles to blind readers equipped with special Braille or audio response terminals. An active marketing program is in progress offering content to information users through both VBI and the TVT1/4 technology

In May, Intel Corporation, the world's largest semiconductor company and a leading manufacturer of personal computer, networking and communications products, signed an agreement with WavePhore that provides for WavePhore to develop data broadcasting technology for Intel. This agreement should facilitate the development and expansion of data broadcasting by incorporating the technology in personal computers and other devices.

^{2/}

(...continued)

signals on any receiver at any site." The TVT1/4 system was demonstrated in the NAB Science and Technology area during the 1994 and 1995 NAB Conventions in Las Vegas, using KTNV, Channel 13. In addition to its use by television broadcasters, the TVT1/4 technology has been used with MCI's Phoenix uplink many times, and WavePhore has transmitted over satellite in the video signals of several superstations. WavePhore presently has a working arrangement with Channel America -- a television satellite program provider -- to piggyback on their signal so as to provide WavePhore with a nationwide multimedia datacasting footprint. WavePhore has also used its TVT1/4 technology on Arizona State University's ITFS system, and TCI's Scottsdale cable system. In addition, the TVT1/4 system has been used in short tests on TCI's Tulsa cable system, which included microwave and fiber optic links, and in a demonstration test over the Congressional cable system in Washington, D.C.

WavePhore and BelCom, Inc., an affiliate of Comsat Corporation, signed an agreement in April that is intended to lead to the widespread use of WavePhore's technology in Russia and the Commonwealth of Independent States. The agreement contemplates the use of WavePhore's technology over the facilities of Russia's largest television broadcast network, Ostankino Television.

WavePhore is in the process of establishing a Japanese subsidiary and is in negotiations or discussions with numerous Japanese broadcasters, content providers, trading houses, equipment manufacturers, and financiers to establish data broadcasting in Japan. WavePhore is presently working with the Japanese Ministry of Posts and Telecommunications (the "MPT") regarding approval of WavePhore's data broadcasting system for use in Japan. WavePhore understands from its discussions that the MPT is looking to the Commission's proceeding for guidance concerning the Japanese approach to data broadcasting.

In Europe, a division of Siemens-Albis AG is serving as the European distributor of WavePhore's technology. The TVT1/4 technology has been used to send data over an Italian television network utilizing the PAL transmission system without difficulty. Tests with the PAL transmission system have also been performed with success in Switzerland. WavePhore is preparing for testing and is actively promoting the development of data broadcasting in Mexico and New Zealand. NTSC datacasting tests have already been conducted in Taiwan.^{3/}

^{3/} WavePhore has participated in a working party of ITU-R Study Group 11 (Television) dealing with auxiliary services and has submitted a report, through the U.S. National Committee of the ITU-R, to the working party as a U.S. contribution describing WavePhore's technology. The report has been accepted by the working party, which is the first step in the adoption of an international standard by the ITU-R.

Data Broadcasting. WavePhore envisions data broadcasting as providing a unique opportunity to use widespread, existing infrastructure (i.e., TV broadcast stations) to distribute data at much faster speeds than with other currently available technology, without affecting the broadcaster's primary business of transmitting video programming.

There are a tremendous number of applications for data broadcasting. These include transmission of digital magazines, newspaper, books and catalogues, audio materials (including multiple language translations of a program being broadcast), computer software, and financial data. In recent years, computer manufacturers have made tremendous progress in making available affordable commercial and personal computers with high-speed processing capabilities and there are a large number of service providers that have available large data bases for computer access, on the Internet and otherwise. This combination of high-capacity computers and large data bases has spurred a growing demand to move large volumes of data from one location to another.

One of the best illustrations of the potential of data broadcasting is the application that Media General's Tampa television station is implementing, using WavePhore's technology to transmit individualized Doppler radar information to over twenty different cable headends throughout the Tampa area to provide up-to-the -minute critical hurricane and other weather information to viewers on those cable systems.

WavePhore believes that data broadcasting can be cost competitive with other technologies, such as telephone and cable facilities that will require major upgrades to transmit high-speed data. WavePhore's current technology is up to 40 times faster than conventional telephone modems in use today. Taking advantage of the existing infrastructure of television broadcast stations, data broadcasting can reach 98 percent of the population of the United States

at far less cost than the billions of dollars required for cable and telephone company upgrades that, even when complete, will be unavailable to millions of U S households..

The NPRM. As part of its efforts to develop data broadcasting, WavePhore sought a declaratory ruling from the Commission that television broadcasters should be permitted to use WavePhore's technology for data broadcasting without further prior approval from the Commission. Letter to Roy Stewart, Chief, Mass Media Bureau, from David Deeds, Chairman, WavePhore (December 9, 1993). WavePhore demonstrated that its technology can be used by broadcasters without causing significant degradation to the signal quality or any interference to the operation of other stations. WavePhore cited several other instances in which the Commission had authorized such ancillary operations by broadcasters

After taking comments last year on WavePhore's request for declaratory ruling, the Commission adopted the instant NPRM, the stated purpose of which is

to determine how best to permit certain digital technologies to be integrated with the current television broadcast service. Specifically, we seek comment on what procedural and substantive rules, if any, we should establish regarding the transmission of ancillary digital data within the active video portion of broadcast television NTSC signals

NPRM at para. 1. The NPRM discusses two general approaches to the transmission of digital data within the video portion of the television signal. The first approach involves Line 22 and the video "overscan" area. The second approach, which includes that of WavePhore's TVT1/4, involves what the Commission characterizes as distributing concealed digital signals throughout the visible picture at sufficiently low amplitudes or confined to such a limited part of the normal

video bandwidth that they are invisible to the general viewing audience. The Commission refers to this second set of data broadcasting technologies as “sub-video” technologies.^{4/}

The NPRM states that the Commission seeks to “encourage the use of television signals for ancillary data transmissions and to permit new technological developments” while proceeding with caution in order to “create a regulatory framework that protects the quality of the NTSC television picture.” NPRM at paras. 34, 23. The Commission proposes that licensees be allowed to transmit acceptable data signals without prior Commission authority or notification. Id. at para. 26. Under the Commission’s proposal, any party inserting data in programming “upstream” would be required to notify the licensee, the licensee would be required to maintain the right to delete the data, and a copy of any contract would need to be maintained at the station. Id. The Commission states that its proposed approach, which it refers to as one of “licensee is responsible,” should give the broadcaster the flexibility to choose among data broadcasting technologies. Id. at para. 27. The Commission also seeks comment on the extent that a broadcaster’s deletion of data might cause degradation to the picture and how to be certain that broadcasters and users are aware of any cumulative effects or harmful incompatibilities among data broadcasting technologies. Id.

The Commission recognizes that picture degradation is difficult to define and detect, but it seeks comment on possible methodologies for detecting degradation and standards for permissible

^{4/} WavePhore’s comments are generally not concerned with the overscan approach. With regard to the Commission’s query as to whether some portion of a sub-video system’s capacity should be set aside for data that was previously transmitted using overscan technology, WavePhore sees no reason for such a set-aside. To the extent a displaced user of overscan technology is interested in using sub-video datacasting, it should be able to make arrangements with broadcasters to transmit its data over the sub-video system, without government mandate.

degradation. NPRM at para. 31. The Commission asks whether certain types of receivers may be more prone to showing degradation than others. Id. It also seeks comment on the extent that it should permit alteration of the video signal or the video bandpass characteristics to permit the insertion of data. Id.

The Commission seeks comment on the need for standards, suggesting that any such need will be reduced if data broadcasts will be directed only to specific subscribers with specialized equipment rather than to the general viewing public. NPRM at para. 34. The Commission acknowledges the work of the National Data Broadcasting Committee, an organization established by the National Association of Broadcasters and the Electronics Industries Association, for the purpose of establishing voluntary industry standards for high-speed data transmissions. The Commission indicates its intention to solicit public comment on any recommendation that the NDBC makes to the Commission. Id. at para. 35. The Commission also seeks comment on the impact of data broadcasting on the development of digital television service and the recovery of spectrum currently used by NTSC stations. Id. at para. 41.^{5/}

Discussion

For the past several years, Washington policy makers and communications industry executives have been talking about the benefits that will accrue to the public from the widespread availability of high-speed digital communications. This proceeding offers an important opportunity for the Commission to expedite that reality. Unlike the cable and telephone industries, over-the-air television broadcasters have the ability to begin immediately transmitting

^{5/} The Commission also asks whether the non-technical policies contained in Sections 73.646 and 73.667 of the rules should be applied to sub-video data transmissions. NPRM at para. 39. This proposal appears to be unobjectionable.

high-speed data to consumers who will be able to access that data using an inexpensive decoder and their existing personal computers and television sets. The technology is available for such a leap. What is needed at this point is Commission action to affirm a broad standard that permits broadcasters substantial latitude to provide secondary services and entrust broadcasters with the responsibility to act consistent with that standard and in their best interests. There is ample evidence that this approach will work

I. The Commission Should Allow Broadcasters Discretion to Select and Use Any Datacasting Technology That Does Not Degrade the TV Signal or Cause Interference to Other Stations

WavePhore contends that its TVT1/4 technology is consistent with present NTSC technology and the Commission's own rules. The Commission has previously found such ancillary uses of the broadcast spectrum to be in the public interest, and has allowed both radio and television broadcasters to make whatever subsidiary use of their channels they desire so long as the use does not constitute a "special signal," *i.e.*, a signal which causes discernable picture degradation or interference to other broadcast stations.^{6/} Where these criteria are met, no prior individual FCC authorizations have been required. Examples of such technologies include use of AM and FM subcarriers and the vertical blanking interval of television transmissions, which have been used for utility loading, teletext, closed captioning, and paging operations.^{7/} In the area of

^{6/} See Uses of Special Signals for Network Purposes Which Adversely Affect Broadcast Service, 22 FCC 2d 779 (1970).

^{7/} See Amendment of Part 2 and 73 of the Commission's Rules Concerning Use of Subsidiary Communications Authorizations, 53 RR 2d 1519 (1983); Amendment of Parts 2, 73 and 76 of the Commission's Rules to Authorize the Transmission of Teletext by TV Stations, 57 RR 2d 842 (1985); Amendment of Parts 2, 73 and 76 of the Commission's Rules to Authorize the Offering of Data Transmission Services on the Vertical Blanking Interval by TV Stations, 57 RR 2d 832 (1985)

television broadcasting specifically, the Commission has previously allowed stations to transmit data in the vertical blanking interval,^{8/} broadcast 3-D programming requiring viewer glasses,^{9/} and transmit low-speed data in the active video signal.^{10/}

In considering the use of teletext, the Commission found that since teletext had numerous public interest benefits, broadcasters could utilize it without prior Commission authorization so long as the use of the vertical blanking interval to transmit information did not degrade picture quality.^{11/} In a separate decision, the Commission found that use of the vertical blanking interval for non-teletext data services such as paging and data delivery was also in the public interest and therefore should be given the same leeway as teletext.^{12/} WavePhore urges the Commission to similarly treat datacasting and allow broadcasters to use its TVT1/4 system so long as no perceptible picture degradation or interference is caused

A. Picture Degradation and Interference Should Not Be a Problem

In its NPRM, the Commission is understandably concerned that the introduction of high-speed data broadcasting not degrade picture quality. Picture quality is a broad concern to the tens of millions of American households that spend many hours each week watching television

^{8/} See Amendment of Parts 2, 73 and 76 of the Commission's Rules to Authorize the Offering of Data Transmission Services on the Vertical Blanking Interval by TV Stations, 57 RR 2d 832 (1985).

^{9/} See Transmission of Three-Dimensional (3-D) Programming by Television Broadcast Stations, 51 RR 2d 661 (1982).

^{10/} See March 3, 1992 letter from Roy J. Stewart to Jane E. Genster of NBC (attached).

^{11/} Amendment of Parts 2, 73 and 76 of the Commission's Rules to Authorize the Transmission of Teletext by TV Stations, 53 RR 2d 1309 (1983).

^{12/} Amendment of Parts 2, 73 and 76 of the Commission's Rules to Authorize the Offering of Data Transmission Services on the Vertical Blanking Interval by TV Stations, 57 RR 2d 832 (1985).

programming. The evidence, however, clearly establishes that there are sub-video technologies that can be deployed by television broadcasters without causing visible degradation. Continued broadcasts using WavePhore's technology in the Phoenix area over more than two years have not led to a single viewer complaint. Recent laboratory testing of WavePhore's technology at the Communications Research Centre confirmed that viewers do not detect any degradation to their picture quality related to the TVT1/4 system. (A copy of the CRC report is attached.) Similarly, the results of the NDBC testing show that both WavePhore's technology and that of the other proponent, even under highly unusual stressed conditions and viewed by experts trained to detect even the slightest degradation, resulted in a finding of acceptable picture quality. As to the Commission's question regarding whether certain types of receivers may be more prone to showing degradation than others, WavePhore's extensive experience to date has not generated any such indication.

The evidence is also favorable concerning data broadcasting not causing interference to other stations. WavePhore has demonstrated that its technology, which is in the active portion of the video signal, cannot cause interference to other stations. WavePhore appreciates the concern that the Commission has for more information concerning the potential for interference from Digideck's technology (NPRM, para. 22), but any such concern is the result of Digideck using a technology that apparently will require a modification to the broadcaster's exciter, a characteristic that necessarily also triggers the need for a new FCC type acceptance for the broadcaster's transmitter. Thus, the Commission will have ample opportunity to consider any interference issue raised by Digideck's equipment in the context of a type acceptance application for which the Commission may solicit public comment if there are significant issues, and no broadcaster will use Digideck's technology until that issue is resolved.

B. The Proposed “Licensee is Responsible” Approach is Appropriate

WavePhore agrees with the Commission’s fundamental approach of entrusting the licensee to make the initial determination of whether to deploy a data broadcast technology. WavePhore urges the Commission to establish a broad policy that broadcasters may use whatever data broadcasting technology they consider to be appropriate, subject to the condition that the data broadcasting not cause significant degradation to the station’s regular television programming. As discussed above, data broadcast technology is available that will not cause visible degradation to picture quality or interference to other stations. Companies such as WavePhore and industry groups such as the NDBC will make available information that will permit broadcasters to judge the ability of any available technology to be used without harming picture quality and any modification of a transmitter that might cause interference will require type acceptance. It is reasonable to expect that the available information also will address any issues of the compatibility of different systems.^{13/}

The Commission should not delay the introduction of new technology due to a speculative concern that broadcasters will not have sufficient information to make reasonable choices or that, given such information, broadcasters will make the wrong choice. Broadcasters have enormous incentives to maintain their picture quality in order to satisfy their regular viewers. It is unfathomable that this economic reality will change in the foreseeable future. Moreover, in the unlikely event that a broadcaster violates the condition that the data broadcasting not cause

^{13/} Existing information indicates that stations should be able to use more than one data broadcasting technology at the same time without causing significant picture degradation or interference. For instance, WavePhore’s technology can be used with VBI technology.

significant degradation to the station's regular television programming, the Commission retains jurisdiction to address the matter.

In a number of past proceedings, the Commission has relied on broadcasters to act in their own best interest and vigilantly protect the quality of their broadcast signals. For example, when the Commission reexamined its technical requirements for television in 1984, the Commission eliminated its technical requirements regarding picture quality, recognizing that broadcasters have sufficient economic incentive to maintain their signal quality. Reexamination of Technical Regulations, 57 RR 2d 391 (1984). Similarly, in 1989, the Commission eliminated the requirement that television stations omit the color burst signal during monochrome transmissions, finding that broadcasters are in the best position to balance the degradation in picture quality caused by inclusion of the color burst signal against the utility of continuing the color burst signal for purposes of synchronizing studio equipment. Television Broadcast Stations (Technical and Operational Regulations), 65 RR 2d 1820 (1989).^{14/} The Commission need not concern itself with policing picture quality, even if a broadcaster chooses to combine multiple datacasting systems. As the Commission stated in Amendment of the Rules Relating to Permissible Uses of the Vertical Blanking Interval of Broadcast Television Signals, 72 RR 2d 1018, 1020 (1993), "[t]he resolution

^{14/} As was the case in Television Broadcast Stations (Technical and Operational Regulations), 65 RR 2d 1820 (1989), the Commission has accepted even readily visible picture distortion where it was necessary to increase a broadcaster's service flexibility. See Television Waveform Standards Concerning Horizontal and Vertical Blanking Intervals, 57 RR 2d 1336, 1337 (1985) (permitting broadcasters to use any VBI timing they deem necessary, despite black borders on television picture caused by excessive timing intervals, since "[i]ncorrect blanking interval timing affects only the viewers of a particular station. Other co-channel and adjacent channel stations are not affected," and "a strong incentive exists for each station to supply the best possible picture."); Three Dimensional Television Programming, 51 RR 2d 661 (1982) (broadcasters allowed to distort picture intentionally to create three-dimensional effect for those viewers equipped with special 3-D viewing glasses).

of any conflicts which may arise from the transmission of multiple services and signals is the responsibility of station licensees.”

WavePhore also urges the Commission not to be overly concerned about minor alterations of the NTSC signal. NPRM at para. 31. Some alteration of the NTSC signal is inherent in any high-speed datacasting technology, but as demonstrated by WavePhore’s technology this alteration does not necessarily lead to harmful results such as picture degradation or interference to other stations. Again, broadcasters should be trusted to make any alterations consistent with the broad standard that their data broadcasting operations not cause significant degradation to the station’s regular television programming.

The Commission also should appreciate the extent to which broadcasters will be hampered in competing with the cable and satellite industries if they are required to adhere to unique picture degradation requirements. Cable is not constrained in its ability to add data to its video transmissions, nor are Direct Broadcast Satellite operators.

C. The Commission Should Not Impose a Single Datacasting Technology as a Standard

WavePhore agrees with the Commission’s suggestion that, to the extent that data broadcasting will be directed to specific subscribers with specialized equipment, there is no need for the Commission to consider adopting one or more technologies as a standard. From WavePhore’s perspective, the market for data broadcasting ultimately is quite large, but at least for the foreseeable future the market is very clearly one characterized by specific subscribers with specialized equipment, most if not all of which will be connected to computers.^{15/}

^{15/} The Commission has imposed standards for technical uniformity on broadcasters only when the supplemental service is meant to be received by the public at large rather than
(continued...)

Chairman Hundt recently noted that “standards are almost always best set by industry through voluntary, consensus-driven processes. They are not, as a rule, best set by government fiat.”^{16/} WavePhore sees no benefit in the Commission attempting to impose a single national datacasting standard.

One of the principal problems with the FCC considering the adoption of a single standard is the time required for such a process. Given limited Commission resources and the contentiousness that is likely to characterize any selection process, such a process could take several years. In light of the limited amount of time remaining for any technology that is based on NTSC technology, such a delay would be fatal.

Another key problem with standards is that they unnecessarily freeze technology, preventing improvements that could be valuable to the market. WavePhore, for instance, is currently improving both the robustness of its TVT1/4 technology and its data transmission speed. If the Commission was to adopt a standard before that upgrade process is complete, WavePhore might be effectively precluded from implementing such an improvement.

^{15/} (...continued)
just subscribers to the service. Thus, the Commission has now adopted standards for AM stereo and ghost-cancelling technology so that every new receiver purchased by consumers will be capable of processing this supplemental data to enhance the listening/viewing experience. See Amendment of the Commission's Rules to Establish a Single AM Radio Stereophonic Transmitting Equipment Standard, 75 RR 2d 208 (1994); Amendment of the Rules Relating to Permissible Uses of the Vertical Blanking Interval of Broadcast Television Signals, 72 RR 2d 1018 (1993). It should also be noted that even with regard to a general audience technology like AM stereo, the Commission declined to adopt a standard until the market had chosen that standard as the marketplace favorite. See Amendment of the Commission's Rules to Establish a Single AM Radio Stereophonic Transmitting Equipment Standard, 74 RR 2d 244 (1993).

^{16/} Keynote Address of Reed Hundt to Cable-TEC Expo Society of Cable Television Engineers, June 14, 1995.

Moreover, limiting broadcasters to a single datacasting technology would not only hinder the rapid development of improved datacasting systems, but also could limit the ability of broadcasters to use additional new technologies. It currently appears that several of the proposed datacasting technologies can be used simultaneously by the same station. Thus, even higher rates of data throughput may be achieved through a hybrid system using multiple technologies. Also, different systems may have different advantages in serving particular markets. Allowing broadcasters to choose the system that works best for them and leaving open the door to a use of more than one of these technologies will ensure the greatest capability and benefits from datacasting.

The Commission should not wait for the conclusion of the National Data Broadcasting Committee process. The NAB and EIA established the committee to gather and disseminate information about the various datacasting technologies then in development with an eye towards issuing voluntary guidelines for datacasting. That process has been and should continue to be useful. It is unclear, however, when the process will conclude.

II. The Commission Should Be Careful in Constructing Any Legal Requirements for Broadcaster Review of Datacasting Content

WavePhore has no objection to the proposal in the NPRM that licensees retain the discretion to have their facilities used for data broadcasting and be able to delete any data that is inserted into their programming without the broadcaster's consent. WavePhore is convinced at this point that, for data broadcasting to prosper, individual broadcasters should have this control over the use of their facilities.

The Commission also proposed in its NPRM that broadcasters should be responsible for the content of data that is broadcast over their signal. See NPRM at 4-5. In making this

proposal, the Commission appears to have had in mind that all datacasting will be program-related, with viewers having decoder chips built into their televisions and broadcasters transmitting data that supplements programming or provides other consumer information or entertainment (e.g., the interactive talking “TV Teddy” proposed by Yes! Entertainment Corp.). Where the broadcaster is serving as a “programmer to the home” through its data transmissions, WavePhore agrees with the Commission that it is appropriate that the broadcaster be responsible for the content of the data.

WavePhore believes that such program-related datacasting, however, often will not be the case, and that broadcasters engaged in datacasting often will be providing a conduit for data transmissions that are more properly considered to be the responsibility of the broadcaster’s customers. It would be very difficult for a broadcaster to take responsibility for or monitor the transmission of medical records, travel bureau fares, and software programming, and to make real-time determinations about its appropriateness. In addition, as the Commission noted in its NPRM, data often will be inserted into the video “upstream,” and the broadcaster would have little involvement in the nature of the data broadcast. See NPRM at 4. In these cases, while it is reasonable to expect that broadcasters will retain the right to terminate any transmissions by content providers that use a broadcaster’s facilities for objectionable or illegal purposes, the Commission should not impose a legal obligation on broadcasters to preview or monitor content.

III. NTSC Datacasting Will Promote and Smooth the Transition to Digital TV

In its NPRM, the Commission requested comment on whether the enhancement of NTSC television channels through datacasting would hinder the transition to digital television by making the eventual recovery of existing NTSC channels more difficult. WavePhore does not see this as a problem, and believes that the initiation of NTSC datacasting (which is effectively providing a

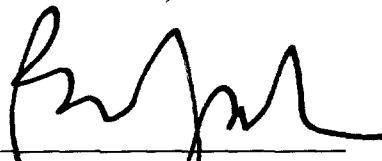
digital path in connection with the existing analog transmission) will actually encourage a smooth transition to the use of digital channels. Although the Commission has yet to make a final decision, it currently appears that digital channels will provide broadcasters with significant datacasting capabilities, and NTSC datacasting systems are therefore an excellent way for broadcasters to begin to develop the potential of datacasting for the eventual transition to digital broadcasting. The biggest obstacle to the transition to digital is the tremendous cost involved in acquiring the necessary equipment. To the extent that NTSC datacasting provides broadcasters with an additional source of revenue during the transition period to cover these costs and demonstrates the potential for continued revenue from datacasting, more stations will be able to acquire the necessary equipment, and all datacasting stations will likely be able to commence the digital transition sooner than would otherwise be the case. Because broadcasters will eventually be able to move their data applications to their digital channels, there is no reason why the Commission should not be able to recover the NTSC spectrum at the appropriate time.

Conclusion

For the above reasons, WavePhore urges the Commission to act expeditiously to adopt a flexible regulatory scheme that will allow broadcasters to engage in high-speed datacasting.

Respectfully Submitted,

WAVEPHORE, INC.

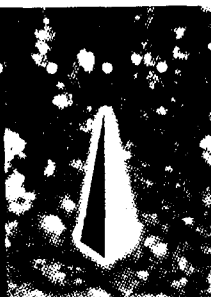
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MULTIMEDIA DATACASTING

